transmitting the continuous phase modulated signal,

receiving the continuous phase modulated signal,

[demodulating the continuous phase modulated signal into a

received baseband signal,] and

filtering the [received baseband] <u>continuous phase modulated</u>

signal into a sequence of filtered signals having absolute phase

for indicating the sequence of data symbols.

2.   (Once Amended) The method of claim 1 further comprising the

steps of ,

sampling the sequence of filtered signals into a sequence of

sampled [signals] <u>symbols</u>, and

[decoding] <u>demodulating</u> the sequence of sampled <u>symbols</u>

[signals] into an estimated data stream.

3. (Once Amended) The method of claim 1 wherein,

the generating step comprises the steps of receiving the data

stream of data bits, formatting the data stream into the sequence

of formatted data pulses as a sequence of data symbols within an M-

ary symbol set,

the modulating step comprises the steps of Gaussian filtering

and frequency modulating for generating the continuous phase

modulated signal, the Gaussian filter step filters the precoded

sequence of data symbols into pulse responses continuously

accumulated over a finite memory time as a filter response, the

Gaussian filtering step is defined by a bandwidth time product

inversely defining the finite memory time, the frequency modulating

step frequency modulates a carrier reference by the filter response

by a modulation index for converting the filter response into the

continuous phase modulated signal,

the [demodulating step is carrier demodulating step for

demodulating the] continuous phase modulated signal <u>is up converted</u>

<u>from baseband during the transmitting step and is down converted to</u>

<u>baseband during the receiving step</u> using a local carrier [into the

baseband signal, the carrier demodulating step further removes a

carrier phase offset between the local carrier and the received

continuous phase modulated signal], and

the filtering step is a matched filtering step for matched

filtering of the received [baseband signal] continuous phase

modulated signal into the filtered signal, the matched filtering is

matched by pulse amplitude modulation representation to the

Gaussian filtering step, the filtered signal has an absolute phase

at a periodic sampling time for indicating the sequence of data

symbols.

4.(Twice Amended) The method of claim 3 wherein,

the modulation index is equal to a fraction selected from a

group consisting of 1/M and (1-1/M) fractions for the M-ary symbol

set where $M=2^k$ and k is an integer.

5. (Twice Amended)   A method for communicating a data stream, the

method comprising the steps of,

generating a sequence of data symbols from the data stream by

formatting the data stream into the sequence of formatted data

pulses as a sequence of data symbols within a 2-ary symbol set,

1   precoding the sequence of data symbols into a sequence of

2 precoded data symbols,

3   Gaussian filtering the precoded sequence of data symbols into

4 pulse responses continuously accumulated over a finite memory time

5 as a filter response, the Gaussian filtering is defined by a

6 bandwidth time product inversely defining the finite memory time,

7   frequency modulating a carrier reference by the filter

8 response by a modulation index for converting the filter response

9 into a continuous phase modulated signal,

10   [demodulating the continuous phase modulated signal by a local

11 carrier and by a carrier phase offset into a received baseband

12 signal,] and

13   matched filtering the received [baseband signal] continuos

14 phase modulation signal into a filtered signal, the matched

15 filtering is matched by pulse amplitude modulation representation

16 to the Gaussian filtering, the filtered signal has an absolute

17 phase at a periodic sampling time for indicating the sequence of

18 data symbols.

19

20 11. (Twice Amended) A method for communicating a data stream, the

21 method comprising the steps of,

22   generating a sequence of data symbols from the data stream by

23 formatting the data stream into the sequence of formatted data

24 pulses as a sequence of data symbols within a[n] 4-ary symbol set,

25   precoding the sequence of data symbols into a sequence of

26 precoded data symbols,

27   Gaussian filtering the precoded sequence of data symbols into

28 pulse responses continuously accumulated over a finite memory time

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as a filter response, the Gaussian filtering is defined by a

bandwidth time product inversely defining the finite memory time,

frequency modulating a carrier reference by the filter

response by a modulation index for converting the filter response

into a continuous phase modulated signal,

[demodulating the continuous phase modulated signal by a local

carrier and by a carrier phase offset into a received baseband

signal, and]

matched filtering the [received baseband signal] continuous

phase modulated signal into a filtered signal, the matched

filtering is matched by pulse amplitude modulation representation

to the Gaussian filtering, the filtered signal has an absolute

phase at a periodic sampling time for indicating the sequence of

data symbols, and

demodulating the sequence of data symbols into an estimate of

the data steam.

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1.   (Once Amended and Rewritten) A method for communicating a data stream, the method comprising the steps of,

generating a sequence of data symbols from the data stream,

precoding the sequence of data symbols into a sequence of precoded data symbols,

modulating the sequence of precoded data symbols into a continuous phase modulated signal,

transmitting the continuous phase modulated signal,

receiving the continuous phase modulated signal, and

filtering the continuous phase modulated signal into a sequence of filtered signals having absolute phase for indicating the sequence of data symbols.

2.   (Once Amended and Rewritten) The method of claim 1 further comprising the steps of ,

sampling the sequence of filtered signals into a sequence of sampled signals, and

demodulating the sequence of sampled signals into an estimated data stream.

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3. (Once Amended and Rewritten) The method of claim 1 wherein,

the generating step comprises the steps of receiving the data stream of data bits, formatting the data stream into the sequence of formatted data pulses as a sequence of data symbols within an M-ary symbol set,

the modulating step comprises the steps of Gaussian filtering and frequency modulating for generating the continuous phase modulated signal, the Gaussian filter step filters the precoded sequence of data symbols into pulse responses continuously accumulated over a finite memory time as a filter response, the Gaussian filtering step is defined by a bandwidth time product inversely defining the finite memory time, the frequency modulating step frequency modulates a carrier reference by the filter response by a modulation index for converting the filter response into the continuous phase modulated signal,

the continuous phase modulated signal is up converted from baseband during the transmitting step and is down converted to baseband during the receiving step using a local carrier, and

the filtering step is a matched filtering step for matched filtering of the received continuous phase modulated signal into the filtered signal, the matched filtering is matched by pulse amplitude modulation representation to the Gaussian filtering step, the filtered signal has an absolute phase at a periodic sampling time for indicating the sequence of data symbols.

///

4. (Twice Amended and Rewritten) The method of claim 3 wherein,

the modulation index is equal to a fraction selected from a group consisting of 1/M and (1-1/M) fractions for the M-ary symbol set where $M=2^k$ and k is an integer.

5. (Twice Amended and Rewritten) A method for communicating a data stream, the method comprising the steps of,

generating a sequence of data symbols from the data stream by formatting the data stream into the sequence of formatted data pulses as a sequence of data symbols within a 2-ary symbol set,

precoding the sequence of data symbols into a sequence of precoded data symbols,

Gaussian filtering the precoded sequence of data symbols into pulse responses continuously accumulated over a finite memory time as a filter response, the Gaussian filtering is defined by a bandwidth time product inversely defining the finite memory time,

frequency modulating a carrier reference by the filter response by a modulation index for converting the filter response into a continuous phase modulated signal, and

matched filtering the received continuos phase modulation signal into a filtered signal, the matched filtering is matched by pulse amplitude modulation representation to the Gaussian filtering, the filtered signal has an absolute phase at a periodic sampling time for indicating the sequence of data symbols.

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11. (Twice Amended and Rewritten) A method for communicating a data stream, the method comprising the steps of,

generating a sequence of data symbols from the data stream by formatting the data stream into the sequence of formatted data pulses as a sequence of data symbols within a 4-ary symbol set,

precoding the sequence of data symbols into a sequence of precoded data symbols,

Gaussian filtering the precoded sequence of data symbols into pulse responses continuously accumulated over a finite memory time as a filter response, the Gaussian filtering is defined by a bandwidth time product inversely defining the finite memory time,

frequency modulating a carrier reference by the filter response by a modulation index for converting the filter response into a continuous phase modulated signal,

matched filtering the continuous phase modulated signal into a filtered signal, the matched filtering is matched by pulse amplitude modulation representation to the Gaussian filtering, the filtered signal has an absolute phase at a periodic sampling time for indicating the sequence of data symbols, and

demodulating the sequence of data symbols into an estimate of the data steam.

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